

JOSHUA LEDERBERG Professor Bo Lindell

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Radiation Protection. Cost-Benefit analysis

Thank you for your prompt reply. I was also deeply gratified at the correspondence of our conclusions; I had had theretofore only a vague intuitive impression that the practice of health-physicists would generate a number in the range of \$10 - 100 per manrad, but surely with many idiosyncratic and irrational exceptions.

Your "PQR" approach is one with which, obviously, I am in close accord. Do you know also Chauncey Starr's paper (Science, 9/19/69) -- which, however, I believe to be quite faulty/ in concept. He does not approach what people will be willing to pay for incremental improvements in safety, under conditions of reasonable information.

William Gorham, now president of the Urban Institute in Washington, D.C., when he was Asst. Secy of HEW for Program Coordination, developed a series of studies published by HEW as "Program Analysis/Disease Control Programs", "1966-5"; they calculate the present value of expected earnings of the "average 27-year old male" at \$125,000, and calculate cost-benefits of other programs accordingly.

I did not directly include non-economic costs in my calculations. If I did, they might exceed the GNP! My approach, like yours, rather observes the economic behavior of people who actually make decisions.

Do you have statistics on the average duty cycle, or manrad per day delivered, per machine?

XXX I fully accept your point on dose-commitment, which was also well-covered in the UN committee analyses of fallout.

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The extrapolation to eventual levels of energy production (pp. 18 ff) may be slightly too rigorous. In principle, one might elect to build somewhat leakier reactors today, and use the economic savings, and engineering design experience, to build even better controlled ones in future. But this does require a rigorous plan (and economic justification .. like PQR...) for the future as well as present program.

What is the present situation, of the cost of population-dose-reduction in the nuclear reactor field?

Would the economic advantage of nuclear power replacement of fossil-fuel today justify using up all, or one tenth, of the ICRP guidelines?